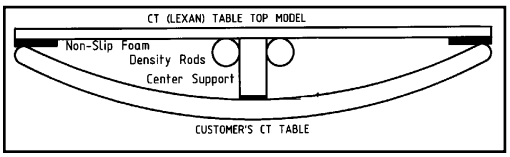
CT / PET TABLE INSERT

For Radiation Therapy Treatment Planning



The ideal CT Image for radiation therapy treatment planning should have the patient on a flat table, magnification indicators, and density markers.

The RPDinc CT/PET Table Insert is made of 3/8" (0.97 cm) clear polycarbonate. The insert measures 84" (213.5 cm) long and the width is custom made to fit the CT or PET Table. A center support runs the length of the insert to prevent any sag.

The CT/PET Table Insert is made with foam rubber edges and will sit on top of the edges of the curved CT bed.

Optional Magnification and Density Rods
The bottom of the CT/PET Table Insert has two 1/8" (3.31 mm) diameter aluminum rods, spaced 30 cm apart that run the length of the insert and are used for magnification measurements.

A 1" (2.54 cm) diameter polystyrene rod and a 1" (2.54 cm) diameter acrylic rod are placed on either side of the center support. Both these rods run 72" (183 cm) along the bottom of the insert. These rods provide a reference for density checks.

Specifications

Table Density: Polycarbonate - 1.2 g/cm³
Rod Density: Acrylic - 1.185 g/cm³ and Polystyrene - 1.05 g/cm³
Size: 84" L x 3/8" T (213.4 x 0.97 cm)
Weight: 55 lb (25 kg)

Item #	Table Manufacturer	Magnification and Density Rods
683-310	GE	Included
683-320	Siemens	Included
683-330	Philips	Included
683-410	GE	Not Included
683-420	Siemens	Not Included
683-430	Philips	Not Included

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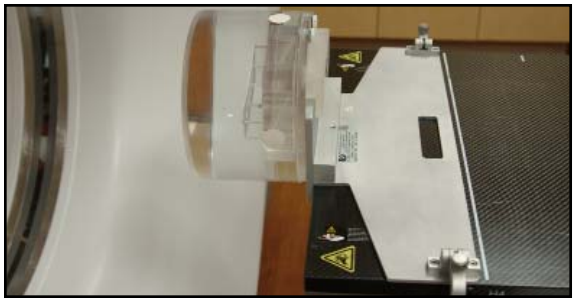
GE LIGHTSPEED PHANTOM HOLDER FOR FLAT TABLE TOP 50 CM WIDE



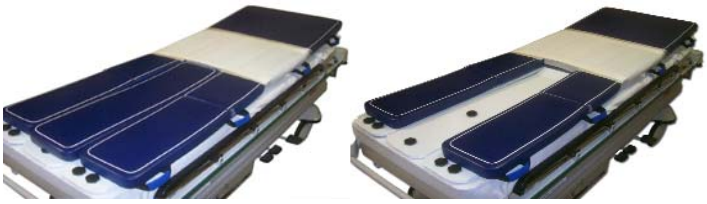
The GE LightSpeed Phantom Holder attaches to a 50 cm wide flat top CT table. The GE LightSpeed Phantom Holder is an easy on, easy off unit for a flat top CT table. The bottom of the front mounting plate references the holder to the front edge of the CT table and the top is where the GE LightSpeed Phantom hooks on to the holder. A small thumb screw allows for leveling of the phantom. The two lock bars are spring loaded upward to be out of the way while securing to the CT table. The large adjustment range allows for different thicknesses of CT table tops. The phantom holder has a built-in handle for easy carrying.

Specifications

Material: Black Anodized Aluminum
Overall Size: 20.8" W x 4.5" L x 6.5" H (52.8 x 11.4 x 16.5 cm)
Mounting Plate Size: 8.45" W x 4.67" H x 0.335" T
(21.5 x 11.8 x 0.8 cm)

Item	Description
018-250	GE LightSpeed Phantom Holder f/FlatTable Top 50cm W

SLESSINGER BOARD FOR HDR BRACHYTHERAPY



Photos courtsey of S.Dahlbeck, MD and A. Fung, PhD, University Medical Center, Lubbock, TX

- **CT and/or MR Compatible**
- **Easy to Clean**

The Slessinger Board is a padded sliding board that is CT and MR compatible. It is designed to facilitate HDR brachytherapy, specifically for pelvic treatments. The patient can be transferred onto the board from the operating room couch and remain on the board in recovery, during imaging for planning and until the HDR treatment is given. The intent is to minimize patient movement to ensure that the imaging for planning is not compromised by patient leg movement prior to treatment and thus delivering the treatment plan faithfully. The legs are slightly elevated, affording ready access to the perineum and preventing applicators from resting against anything. Leg elevation is maintained with the use of two (2) tightening knobs at the end of the elevation panels. Transfers on and off CT/MR/simulator couches are relatively easy due to the smooth plastic bottom surface and side handles. The board is also very useful when a patient is transferred via ambulance from the surgical facility to the treatment facility.

Image guided HDR brachytherapy is gaining in prominence. Prostate and gynecological applications are reliant on patient stability and comfort between the acquisition of imaging for planning and treatment. Although the Slessinger Board was devised to facilitate precise prostate HDR brachytherapy its application for image guided GYN HDR is also very significant with increasing reliance on DVH analyses. The concept of limiting rotation of a multichannel APBI balloon is yet another possible application, by avoiding the patient walking between imaging and treatment prior to each treatment fraction. The rationale and description of the Slessinger Board has also been described in the Brachytherapy Journal article by Slessinger, entitled "Practical considerations for prostate HDR brachytherapy", published early in 2010.

The Slessinger Board can be easily cleaned with non-caustic germicidal cloths or sprays. Patients may not be carried on the Slessinger Board, but rather are transferred directly from one support to another.

Specifications

Item 946-000 - Standard Width
Base Dimensions: 24" W x 72" L x 0.75" T (61 x 183 x 1.9 cm)
Base Material: Corrugated polypropylene
Pad Dimensions: 23.5" W x 69" L x 1.5" T (60 x 175 x 3.8 cm)
Pad Material: Vinyl coated closed cell foam
Weight Limit: 350 lb (159 kg)

Item 946-002 - MR Width
Base Dimensions: 21" W x 72" L x 0.75" T (53.3 x 183 x 1.9 cm)
Base Material: Corrugated polypropylene
Pad Dimensions: 20.5" W x 69" L x 1.5" T (52.3 x 175 x 3.8 cm)
Pad Material: Vinyl coated closed cell foam
Weight Limit: 350 lb (159 kg)

Item	Description
946-000	Slessinger Board for HDR Brachytherapy, 24" Wide
946-002	MR Slessinger Board for HDR Brachytherapy, 21" Wide

VISIONMARK™ CT

The VisionMark™ CT markers offer the perfect combination of tack surfaces and easy-peel corners, keeping the markers correctly positioned with minimal discomfort to the patient on removal. These **NON-METALLIC** markers reduce read time on CT scans with virtually no scatter. These sizes and ball densities are perfect for all CT skin marking applications. Available in 3 mm, 4 mm, and 5 mm ball sizes. No lead means they are safer for yourself, your patient and the environment.

Item	Visionmark™ CT	Quantity
680-305	2.0 mm Ball	50
680-310	2.5 mm Ball	50
680-312	3.0 mm Ball	50
680-314	4.0 mm Ball	50
680-316	5.0 mm Ball	50

CT Mark
Wire and Dots

The CT Mark wire and dots are a new blue formation designed specifically for CT. These markers are lead free, will not cause artifact (scatter) on CT scans and the labels are latex-free.

Item	Description	Quantity
680-349	CT Mark Wire, 1.0 mm	330 cm
680-350	CT Mark Wire, 2.0 mm	300 cm
680-352	CT Mark, 2.3 mm	110
680-354	CT Mark, 4.0 mm	50

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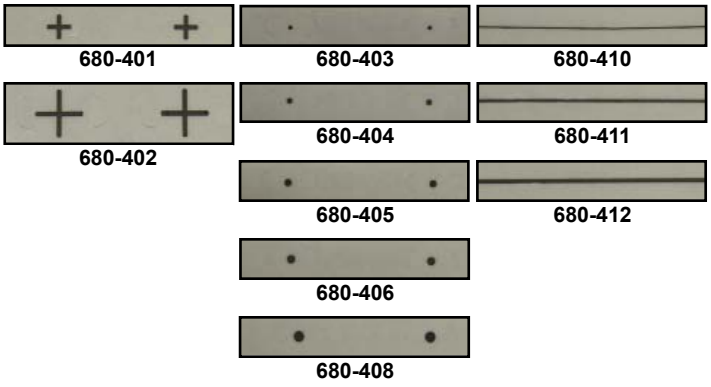
CT MARKER-INDICATOR RADIOPAQUE



- **Use in CT, RT Simulation, Treatment Planning, Diagnostic Radiology, Angiofraphy, Mammography and Fluoroscopy**
- **Use to identify masses, scar tissue, moles, birth marks or any point of interest**
- **Provides a clear and accurate reference point with no spray artifacts**
- **Flat marker - will not indent tissue**
- **Disposable**
- **Clear adhesive backing**
- **Multiple sizes available**
- **Lead Free**
- **Crosses - 0.38" L (9.5 mm)**
- **Dots - 0.125" diameter (3 mm)**
- **Lines - cut to desired length**
- **NOT for use in MRI**

Item #	CT Marker-Indicator Radiopaque	Quantity
680-401	Crosses, 10 mm	130
680-402	Crosses, 20 mm	130
680-403	Dots, 1.5 mm	115
680-404	Dots, 2.0 mm	115
680-405	Dots, 2.5 mm	115

Item #	CT Marker-Indicator Radiopaque	Quantity
680-406	Dots, 3.0 mm	115
680-408	Dots, 4.0 mm	115
680-410	Line, 0.5 mm	69" (175 cm)
680-411	Line, 1.0 mm	66" (167 cm)
680-412	Line, 1.50 mm	62.5" (159 cm)

MULTI-MODALITY MARKERS

462-029 462-030

Item 462-029 Multi-Modality Markers for Radiology/Radiation Therapy
- Appears as bright object on CT, MRI and Diagnostic Imaging scans
- Inner center hole affords passage of needle through central hole
- 15 mm outer diameter and 3.5 mm thick
- 5 mm axial hole with 2 mm central hole
- Composed from hydrogel with medical grade adhesive

Item 462-030 Multi-Modality Markers for Nuc Med/PET
- Visible on Nuclear Medicine, CT and MRI scans
- Liquid-containing well suitable for injection of short-life radionuclide using a conventional hypodermic needle
- 15 mm outer diameter and 3.5 mm thick
- 5 mm axial hole
- Composed from hydrogel with medical grade adhesive

Item #	Description	Quantity
462-029	Multi-Modality Markers for Radiology/Radiation Therapy	50
462-030	Multi-Modality Markers for Nuc Med/PET	50

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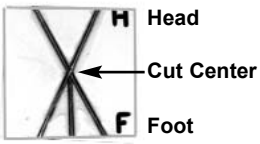
CT MARKER



Material: Aluminum Wire
Size: 1" (2.54 cm) Square

Item #	Description
680-125	CT Marker

MULTIMODAL SPOT MARKERS

Written Verification of Radioactive Materials License is Required to Place an Order

The Multimodal Spot Markers are used for patient orientation and image registration in camera studies. The Co-57 is used for CT-SPECT and Ge-68 and Na-22 for CT-PET fusion imaging.

Specifications

Model MMS02
Capsule: 1" dia. x 1/4" (2.54 x 0.64 cm) thick clear cast acrylic
Active Dimensions: 1.5 x 1.5 mm cylinder
CT Target: 1/4" (0.64 cm) OD bone-equivalent ring (surrounds active element)
Suggested Usage: Multimodal fiducial marker for image coregistration

Model MMS03
Capsule: 1" dia. x 1/4" (2.54 x 0.64 cm) thick clear cast acrylic with etched "crosshairs" centered on active element for laser alignment
Active Dimensions: 1 mm diameter sphere
CT Target: 2 mm OD bone-equivalent ring (surrounds active element)
Suggested Usage: Multimodal fiducial marker for image coregistration

Model	Nuclide	10 µCi .37 MBq	25 µCi .925 MBq	50 µCi 1.85 MBq	100 µCi 3.7 MBq
MMS02	Co-57	680-200	680-201	680-202	680-203
MMS02	Ge-68	680-210	680-211	680-212	680-213
MMS02	Na-22	680-220	680-221	680-222	680-223
MMS03	Co-57	680-230	680-231	680-232	680-233
MMS03	Ge-68	680-240	680-241	680-242	680-243
MMS03	Na-22	680-250	680-251	680-252	680-253

SIMULATOR LEAD FOIL TAPE

Simulator Lead Foil Tape is used on the patient to outline the treatment field. It sticks to patients and is easily removable.

Item	Description	Quantity
428-250	Simulator Lead Foil Tape 0.25" (0.635 cm) Wide	36 Yds (33 m)

CT MARKING WIRE

682-090 **682-100** **682-102** **682-104**

Item	Description	Quantity
682-080	Aluminum Wire 0.080" (2.03 mm) Diameter	42' (12.8 m)
682-090	Aluminum Wire 0.040" (1.02 mm) Diameter	175' (53.3 m)
682-100	Aluminum Wire 0.064" (1.63) mm Diameter	67' (20.4 m)
682-102	Copper Insulated Wire, Black 0.055" (1.40) mm Diameter	100' (30.5 m)
682-104	Copper Insulated Wire, Red 0.080" (2.03) mm Diameter	100' (30.5 m)

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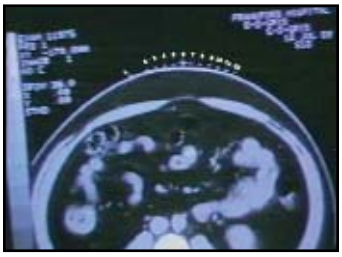
THE FAST FIND GRID™

The Low-Cost Positioning Grid for Quick, Accurate CT Biopsies and Drainage Procedures



- **Cuts down on repositioning by finding the point of entry quickly and accurately, thus reducing repeated x-ray exposure**
- **Helps prevent cross-contamination with one-time use only**
- **Allows precise pinpointing of area with marking pen**
- **Helps provide greater patient comfort**

The Fast Find Grid is a simple, disposable tool that can be used for all computed tomography (CT) guided biopsies and drainage procedures, regardless of the body part. This includes thyroid, lung, liver, abdominal, pelvic and extremity biopsies and drainages.

Why should doctors use the Fast Find Grid? It's about saving time.

- By increasing the accuracy of needle placement with 1 cm markings on the grid.
- By reducing the number of needle re-positioning and rescanning with radio-opaque markers prior to needle placement.
- No slipping: Taped edges assures it stays in place.
- Extremely flexible. Conforms to areas scanned, no problem to position.

Item #	Description
680-450	Fast Find Grid for CT Biopsy

CT RECTAL MARKER

Rectal - Vaginal - External

The **NON-METALLIC** CT Rectal Marker is a flexible tube packed with teflon balls spaced at 1 cm intervals from center to center.

The Rectal Marker is used to accurately obtain both the rectum position and magnification by counting the balls. This determines the rectum location relative to the radiation field.

An adjustable anus marker can be utilized during CT simulation.

The Rectal Marker can be used as a vaginal marker or an external marker.

Specifications

Sterilization: Gas
Tubing: 5/16" (8 mm) Dia. x 30 cm Flexible
Balls: 3/16" (5 mm) Dia. Spaced Every cm
Anus Locator: Adjustable Delrin
Latex Cover: 2.0 cm Dia. x 30 cm L

Item #	Description
460-010	CT Rectal Marker with Anus Marker
460-006	Latex Cover for Rectal Marker, 1/pkg
460-006-12	Latex Covers for Rectal Marker, 12/pkg

SHADOWFORM MARKERS

460-501 460-502 460-503

- **T-Bar handle which can be removed for insertion of barium**
- **Disposable**
- **Rectal markers are available in two lengths and are marked at 1 cm intervals**
- **No cross contamination**
- **Outlines the soft tissue of the pelvic region**
- **Latex-free**
- **Markers are made from a soft, smooth, flexible plastic**
- **Used for Simulation and CT Planning**
- **Provides excellent localization of pelvic structures**

CE

Item	Shadowform Markers	Quantity
460-501	18 cm Vaginal Marker	10
460-502	38 cm Rectal Marker	10
460-503	10 cm Rectal Marker	10

CT VAGINAL DEPTH SCALE

The **NON-METALLIC** CT Vaginal Depth Scale is 1.6 cm in diameter and 26 cm long and has teflon balls which are spaced 1 cm apart and are 5 mm diameter. A delrin introitus marker is included with the 1.6 cm diameter vaginal scale (Item 707-145). A thumb screw holds the introitus marker in position.

The Vaginal Depth Scale Holder (Item 707-020) can be used in CT if the area to be scanned does not include the holder.

Specifications

Material: Acrylic
Density: 1.1859 g/cm³

Material: Teflon
Density: 2.16 g/cm³

Item #	Description
707-145	CT Vaginal Depth Scale with Introitus Marker
707-020	Vaginal Depth Scale Holder
460-006	Latex Cover for Vaginal Depth Scale, 1/pkg
460-006-12	Latex Covers for Vaginal Depth Scale, 12/pkg

3.2 cc CT ION CHAMBER

Specifications

Detector Type: Vented air ion chamber (5 x 30 cm)
Volume: 3.2 cc
Sensitive Length: 10.0 cm
Chamber Material: Polystyrene
Chamber Inside Diameter: 6.4 mm
Chamber Wall Thickness: 54 mg/cm^2
Electrode Material: Aluminum
Sensitivity: 10 R•cm/nC (nominal)
Standard Calibration: 100 kVCP, 5.5 mm Al HVL (NIST Tech. M100)
Response Uniformity Along Axis: ± 3% over central 90% of active length
Beam Orientation: Normal to chamber axis
Phantom Adapter OD: 1.27 ± 0.04 cm (0.50 ± 0.015 in)
Leakage Current (300 V collection potential): < 10^{-13} A at 10 min polarization time,<10^{-14} A at 2 hr polarization time
Intensity Limits: Continuous beam: 4.86 kR/min (1% recombination loss)
Pulsed Beam: 51.5 mR/pulse (1% recombination loss)
Maximum Pulse Repetition Rate: 3.3 kHz
Cable Length: 3' (0.9 m)
Operating Voltage: -300V

Item #	Description
300-505	CT Ion Chamber, 3.2 cc, with triax BNC: used with the 35040 (ATD), TRIAD™ and TRIAD™ TnT
300-515	CT Ion Chamber, 3.2 cc, with coax BNC for signal and banana plug for bias: used with the 4000, 8000 and RAD-CHECK® PLUS Dosimeter

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10 cc CT ION CHAMBER

Specifications

Detector Type: Vented air ion chamber
Volume: 10.1 cc
Sensitive Length: 10.0 cm
Chamber Material: Acrylic (PMMA)
Chamber Outside Diameter: 0.5 in ± 0.015 in (12.7 mm ± 0.4 mm)
Chamber Inside Diameter: 0.45 in (11.44 mm)
Chamber Wall Thickness: 77 mg/cm^2
Electrode Material: Aluminum, 1100
Sensitivity: 3.2 R•cm/nC (nominal) or 0.3/nC
Standard Calibration: 100 kVCP, 5.5 mm Al HVL (NIST Tech. M100)
Response Uniformity Along Axis: ± 3% over central 90% of active length
Beam Orientation: Normal to chamber axis
Leakage Current: (300 V collection potential) Less than 10^{-14}A at 10 min polarization time
Intensity Limits: Continuous beam: 31.6 R/Sec, (1% recombination loss)
Pulsed Beam: 15.8 mR/pulse (1% recombination loss)
Collection Time: 0.478 mSec
Cable Length: 3' (0.9 m)
Operating Voltage: -300 V

Item #	Description
300-510	CT Ion Chamber High Sensitivity, 10 cc for multislice CT, with triax BNC: used with the 35040 ATD and other electrometer/dosimeters, including TRIAD™ and TRIAD™ TnT

EXRADIN A17 SLICE THERAPY CT CHAMBER

Exradin A17 Schematic

- **Fiducial markers identify center and both ends of the collecting volume providing easy setup in relation to the beam**
- **Proven guard design yields stable, precise measurements and minimizes settling time by creating uniform field lines**
- **Shell and guard are made of durable, long lasting Shonka conductive plastic**
- **Use of homogeneous material throughout the chamber minimizes perturbation of the beam due to the presence of the chamber and optimizes measurements**
- **Axially symmetric design of the chamber provides an uniform, isotropic response**
- **Inherent waterproof construction eliminates need for additional protective coverings**
- **The Model A17 Exradin Slice Therapy Chamber has an inherent ^{60}Co buildup cap built into its wall thickness for air calibrations and measurements**
- **Ionization collection efficiency is 99.9% or better**
- **Collecting volume is 1.91 cc**

CT ion chambers combine robust design with uniform energy response for high energy MV applications.

For performing measurements necessary for calculating CTDI (CT dose index)
The Model A17 Exradin Slice Therapy Chamber is designed for tomotherapy applications. This chamber is useful for weekly QA checks or patient dose verification with phantoms or water tank setups. It has excellent response uniformity over the central 8 cm of the chamber length, with variation less than plus or minus 1.5%.

Fast, Precise Measurements
Its waterproof construction makes it ideal for checking the consistency of beams at various jaw widths. The chamber vents through a flexible tube that surrounds the triaxial cable, ensuring the collecting volume is in pressure equilibrium with the surroundings. The design assures there are no stem or voltage soakage effects, providing precise and reliable measurements.

Durable Construction, Built to Last
The Model A17 Exradin Slice Therapy Chamber is constructed of rugged C552 Shonka air-equivalent plastic, providing excellent conductivity and years of reliable use.

Specifications

Collecting Volume: 1.91 cm^3
Collecting Volume Length: 8.0 cm
Collector Diameter: 2.4 mm
Body Tube Outside Diameter: 12.7 mm
Wall Thickness: 3.3 mm
Chamber Length: 17.0 cm
Body Tube and Guard Material: Shonka air-equivalent plastic C552
Response Uniformity Over the Central 8.0cm of Chamber Length: ±1.5%
Collector Material: Carbon fiber
Electrical Power Requirements: Operates at ±300 VDC
Nominal Collection Efficiency: 100%
Maximum Polarizing Potential: 1000 V
Nominal Inherent Leakage Currents: 10^{-15} A
Low-Noise Triaxial Cable: 50 ohms, 29 pF/ft, 1.5 m long
Signal Connector: Triaxial BNC plug (2-Lug, male pin); others available upon request
Waterproof: Yes
Product Standards: CE_{0413}, Designed to meet IEC 60601-1, IEC 61674
CE

Item	Description
300-540	CT Chamber, Exradin A17 Slice Therapy

EXRADIN A101 CT CHAMBER

Exradin A101 Schematic

- **Fiducial markers identify center and both ends of the collecting volume providing easy setup in relation to the beam**
- **Proven guard design yields stable, precise measurements and minimizes settling time by creating uniform field lines**
- **Shell and guard are made of durable, long lasting Shonka conductive plastic**
- **Use of homogeneous material throughout the chamber minimizes perturbation of the beam due to the presence of the chamber and optimizes measurements**
- **Axially symmetric design of the chamber provides an uniform, isotropic response**
- **Ionization collection efficiency is 99.9% or better**
- **Collecting volume is 4.54 cc**

Uncompromising Quality
CT ion chambers combine robust design with uniform energy response for low energy kVCT applications.

For Performaing Measurements Necessary For Calculating CTDI (CT Dose Index)
The Exradin Model A101 CT Ion Chamber is designed to perform the measurements necessary for calculating the CTDI (computed tomography dose index) as described in the AAPM TG 74, Quality Control in Diagnostic Radiology. The chamber is 10 mm in diameter and comes with an acrylic sheath for use with phantoms that have the typical 13.1 mm cavity. It has excellent response uniformity over the central 10 cm of the chamber length, with variation less than plus or minus 3%.

Fast, Precise Measurements
Model A101 is ideal for checking the consistency of beams at various jaw widths. The chamber is vented to the ambient, ensuring the collecting volume is in pressure equilibrium with the surroundings. The design assures there are no stem or voltage soakage effects, providing precise and reliable measurements.

Durable Construction, Built to Last
The Model A101 CT Chamber is constructed of rugged C552 Shonka air-equivalent plastic, providing excellent conductivity and years of reliable use.

Specifications

Collecting Volume: 4.54 cm^3
Collecting Volume Length: 10.0 cm
Collector Diameter: 2.4 mm
Body Tube Outside Diameter: 10.0 mm
Wall Thickness: 1.0 mm
Chamber Length: 164.3 mm
Body Tube and Guard Material: Shonka air-equivalent plastic C552
Response Uniformity Over the Central 10 cm of Chamber Length: ±3%
Energy Response: 80 kVp to 150 kVp ±4%
Collector Material: Carbon fiber
Electrical Power Requirements: Operates at ±300 VDC
Nominal Collection Efficiency: 100%
Maximum Polarizing Potential: 1000 V
Nominal Inherent Leakage Currents: 10^{-15} A
Low-Noise Triaxial Cable: 50 ohms, 29 pF/ft, 1.5 m long
Included Adapter Sleeve: Wall thickness of 1.3 mm; constructed of PMMA
Signal Connector: Triaxial BNC plug (2-Lug, male pin); others available upon request
Waterproof: No
Product Standards: CE_{0413}, Designed to meet IEC 60601-1, IEC 61674
CE

Item #	Description
300-550	Exradin A101 CT Chamber

PTW CT CHAMBERS

PTW 30009 CT CHAMBER

Vented cylindrical pencil chamber for dose length product measurements in computed tomography

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- Pencil type chamber for measurements within a CT head or body phantom or free in air
- Provides a sensitive measuring length of 10 cm
- Shows a homogeneous response over the whole chamber length

The CT chamber is a vented cylinder chamber designed for dose length product and dose length product rate measurements in computed tomo graphy. The chamber allows the determination of the $CTDI_{100}$[1], $CTDI_W$[2] and $CTDI_{Vol}$[3] according to IEC 61223-2-6 and IEC 61223-3-5.

[1]$CTDI_{100}$ = Computed Tomography Dose Index 100

[2]$CTDI_W$ = Weighted $CTDI_{100}$

[3]$CTDI_{Vol}$ = Volume $CTDI_W$

Item	Description
300-560	PTW 30009 CT Chamber, 3.14 cc

PTW 30017 CT CHAMBER

Vented cylindrical pencil chamber for dose length product measurements in computed tomography

- Pencil type chamber for measurements free in air
- Provides a sensitive measuring length of 30 cm
- Shows a homogeneous response over the whole chamber length

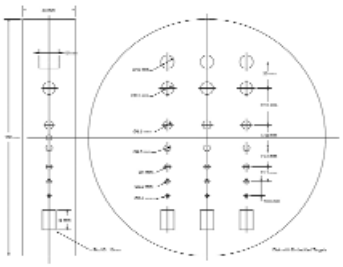
The CT chamber is a vented cylinder chamber designed for dose length product and dose length product rate measurements in computed tomo graphy according to the amendment to IEC 60601-2-44.

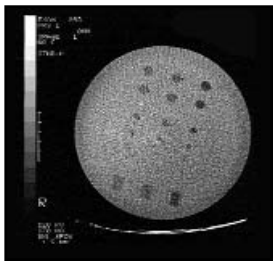
Item	Description
300-565	PTW 30017 CT Chamber, 9.3 cc

Specifications	Item 300-560	Item 300-565
PTW Model	30009	30017
Type of Product	Vented pencil type chamber	
Application	Dosimetry in computed tomography	
Measuring Quantity	Air kerma length product, exposure length product	
Reference Radiation Quality	120 kV, HVL 8.4 mm Al (RQT9)	
Nominal Sensitive Volume	3.17 cm^3	9.3 cm^3
Design	Not waterproof, vented,pencil type	
Reference Point	Chamber center	
Direction of Incidence	Radial	
Nominal Response	14 nC/(Gy·cm)	14 nC/(Gy·cm)
Chamber Voltage	-100 V nominal ± 500 V maximal high voltage to be connected only with active current-limiting device (I_{max}< 0.5 mA)	
Energy Response	≤ ±5% for 70 - 150 kV	≤ ±5% for 50 - 150 kV
Leakage Current	≤ ±10 fA	
Cable Leakage	≤ 1pC/(Gy·cm)	
Materials and Measures		
Wall Material	1 mm PMMA,graphite coated	
Wall Area Density	119 mg/cm^2	
Dimension of Sensitive Volume	Radius 3.5 mm Length 100 mm	Radius 3.5 mm Length 300 mm
Wall Area Density	119 mg/cm^2	
Electrode	Al tube, graphited outer diameter 3 mm	
Ion Collection Efficiency at Nominal Voltage		
Ion Collection Time	274 µs	
Max. Dose Rate for ≥95.0% saturation	12.4 Gy/s	
Max. Dose Per Pulse for ≥95.0% saturation	2.26 mGy	
Useful Ranges		
Chamber Voltage	± 100 - 400 V	
Radiation Quality	50 - 150 kV electrons	
Temperature	10° to 40° C, 50° to 104° F	
Humidity	10 to 80%, max 20 g/m^3	
Air Pressure	700 - 1060 hPa	

SPIRAL/HELICAL CT PHANTOM

Optimize Collimation and Table Speed (Pitch) to Ensure Detection of Small Lesions in the Abdominal Cavity





- **Usable on all standard and helical scanners**
- **Target Contrast = 5, 10, 20 HU above background**
- **Valid contrast at all energy settings**
- **Compact**
- **Indestructible**

The Spiral/Helical CT Phantom is designed to test scanning protocols to verify that small low contrast lesions will be detected. The phantom permits complete testing of low contrast lesion detectability when scan parameters are varied. These parameters include collimation, pitch, reconstructed field of view, reconstruction algorithms, z-axis interpolators, kVp, mA and rotation time. Testing can be applied to protocols designed for head and abdomen. The Spiral/Helical CT Phantom contains clinically-relevant spherical targets that are 5, 10 and 20 HU above the background matrix (Plastic Water® LR).

Item 680-061 Spiral/Helical CT Phantom Includes

(1) CT Disk (Plastic Water® LR)
(1) Water Equivalent Base
(1) Water Equivalent Top
(1) Soft-sided Carrying Case

Specifications
Size: 8" x 7" x7" (20.3 x 17.8 x 17.8 cm)
Material: Tissue Equivalent epoxy materials
Weight: 12 lb (5.4 kg)

Item #	Description
680-061	Spiral/Helical CT Phantom

B

CT DOSE PHANTOM

Acrylic

Photo Unavailable

- **Usable on all CT scanners**
- **Head and abdominal configurations included**
- **Made from acrylic with a density of 1.19 gm/cc**
- **Includes 10 PMMA plugs**
- **1.31 cm inside hole dia. sized for standard CT Dose probes**
- **Rugged foam lined carrying case included**

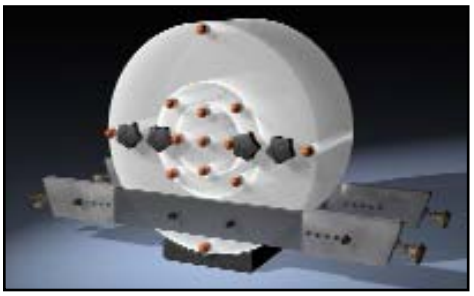
The CT Dose Phantom consists of two 15 cm thick Solid PMMA disks measuring 16 cm (head) and 32 cm (body) in diameter.

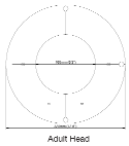
The disks have five through-holes with an inside diameter of 1.31 cm to accommodate standard CT dose probes and five acrylic rods to plug the holes not in use. One hole is at center and four are around the perimeter, 90° apart and 1 cm from hole center to the outside edge of the phantom.

The head and body phantoms along with the ten acrylic rod plugs are packaged in an extremely rugged foam lined carrying case.

Item	Description
682-005	CT Dose Phantom, Acrylic

CT DOSE PHANTOM





682-007-14, 682-007-15 and 682-007-16

- **Abdominal and Adult Head configurations**
- **PMMA disks and plugs with density of 1.10 g/cc**
- **1.31 cm diameter holes sized for standard CT Dose probes**
- **Nesting PMMA disks minimize storage space**
- **Compatible with all CT scanners**

For all computed tomography systems, the Food and Drug Administration recommends measuring the CT Dose Index. Each section of the CIRS CT Dose Phantom can provide separate dose information. The user can also measure maximum, minimum and mid-range values of the nominal tomographic section thickness when performing dose profile measurements.

The CT Dose Phantom consists of a set of a nesting 15 cm thick solid PMMA disks measuring 16 cm (head) and 32 cm (body) in diameter. The adult head disk is also suitable for pediatric body measurements. Handles on the body and head are provided for ease in handling and maneuverability.

Through holes measuring 1.31 cm in diameter will accommodate standard CT probes. Acrylic rods are provided to plug the holes when not in use. The acrylic rods are machined to receive 1 mm diameter TLD rods.

The CT Dose Phantom is manufactured to comply with the FDA's performance standard, 21 CFR 1020.33 that details the measurement requirements.

An optional Support Bracket can be used to suspend the CT Dose Phantom above the imaging couch and align it along the axis of X-ray tube rotation. This enables the phantom to be used to assess CT dose in helical mode or any mode that requires the extended travel of the imaging couch or a wide beam. This set-up might be used to address the dosimetry approach described in TG111. An additional application of the support bracket is to provide a body to simulate continous scatter radiation from the patient during helical CT for dose safety measurements inside and outside the exam room.

Replacement acrylic rods are available in 14, 15 or 16 cm long.

Item 682-007 CT Dose Phantom Includes

(1) Abdominal Cylinder
(1) Adult Head Cylinder
(9) Acrylic Rods
(1) Foam Lined Carry Case
(1) User Guide
(1) 48 Month Warranty

Specifications

Overall Dimensions: 12.5" x 12.5" x 5.5" (31.8 x 31.8 x 15 cm)
Weight: 29 lb (13 kg)
Materials: PMMA

Item #	Description
682-007	CT Dose Phantom
682-009	CT Dose Phantom Support Bracket, Optional
682-007-14	Acrylic Rod CT Probe, 1.31cm Dia. x 14cm Long
682-007-15	Acrylic Rod CT Probe, 1.31cm Dia. x 15cm Long
682-007-16	Acrylic Rod CT Probe, 1.31cm Dia. x 16cm Long

HEAD/BODY CT PHANTOM

- **Head Module of a uniform disc of Solid Water® Material**
- **Ring of Bone mimicking material that mounts around the head module is included**
- **Body scanning module, body annulus is mounted on the head module.**
- **The head has 5 tapered cavities which accept tapered inserts and the body annulus ring has 4 cavities, providing a total of 9 test positions.**

The Head/Body CT Phantom provides a set of tools for evaluating CT image quality. The main modules are constructed of Solid Water®. This permits testing without the difficulties of filling phantoms with water. The set of standard inserts is sufficient for many users. The Head/Body CT Phantom comes complete with a custom carrying case.

Specifications

Phantom Construction: Solid Water® Material
Inserts Included:
(9) Uniform Solid Water® inserts for measurement of Noise, CT Number, and Uniformity
(1) Edge/Contrast Scale Response
(1) Spatial Resolution (1.50 to 0.4 mm at 100% contrast)
(1) Low Contrast Detectability (0.6%)
(1) Alignment Artifact (Aluminum Pin)
(4) Alignment, Slice Thickness, Phantom Position
(2) Slice Thickness and Sensitivity Profile 2:1 Slope (26.6° Slope)
(2) Beam Hardening Artifact (Simulated Bone)
(6) Linearity
Case Size: 24" x 16" x 8" (70 x 41 x 22 cm)
Weight: 35.7 lb (16.2 kg)

Item #	Description
682-461	Head/Body CT Phantom

TISSUE CHARACTERIZATION PHANTOM

- **Easy method for electron density measurement of different tissue materials**
- **14 different tissue and insert materials to measure**
- **Distance measurement holes to assist in measuring CT distance measurement accuracy**
- **Includes a handy carrying case for storage and transportation**
- **Proven Solid Water core design**
- **Interchangeable rods permits positioning customization**
- **Interchangeable inserts of materials permits easy measurement of a wide range of tissues**
- **Compact design makes storage and transportation simple and easy**
- **Wide range of materials permits full range of measurements**
- **Optional Titanium and Stainless Steel inserts available**
- **Economical**
- **Also permits checking the CT scanner's distance measurement accuracy**
- **Data measured can be transferred to the TPS for more additional corrections for tissue inhomogeneities**

Accurate corrections for tissue inhomogeneities are a critical part of isodose treatment planning. Although most computerized treatment planning systems currently use CT image data, these systems frequently use empirical formulae in computing correction factors for tissue inhomogeneities.

The Tissue Characterization Phantom can be used to establish the relationship between the electron density of various tissues and their corresponding CT number in Hounsfield Units. This data can then be transferred to the computerized treatment planning system for more accurate corrections for tissue inhomogeneities.

Scanning the phantom on a periodic basis provides data useful for the QA program of both the CT scanner and treatment planning system.

The Phantom consists of a Solid Water disk approximately the size of an average pelvis. A matrix of 16 holes in the disk hold interchangeable rods made of various tissue and water simulating materials. The physical density (gm/cm^3) and electron density relative to water of the rod materials are provided on a specification sheet with each phantom. The phantom also has a pattern of small air holes with known spacings for checking the CT scanners's distance measurement accuracy. A handy carrying case is also included.

Specifications

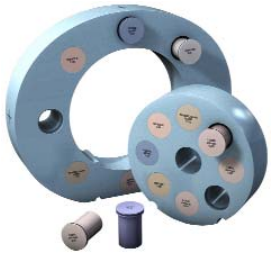
Disk Material: Solid Water® (Gammex 451)
Size: 12.9" Dia x 2" H (32.8 x 5.08 cm)
Weight of Disk and Rods: 10 lb (4.6 kg)
Phantom with case: 14.5 lb (6.6 kg)
Warranty: One year

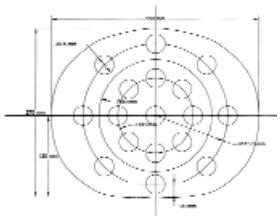
Rod Material	Electron Density Relative to Water	Physical Density g/cm^3
Lung (LN-300)	0.29	0.30
Lung (LN-450)	0.40	0.45
Adipose (AP6)	0.90	0.92
Breast	0.96	0.99
CT Solid Water	0.99	1.02
Brain	1.05	1.05
Liver (LV1)	1.07	1.08
Inner Bone	1.09	1.12
Bone (B200)	1.11	1.15
Bone (CB2-30% Mineral)	1.28	1.34
Bone (CB2-50% Mineral)	1.47	1.56
Cortical Bone (SB3)	1.69	1.82
True Water	1.00	1.00
Optional Titanium Insert	3.79	4.59
Optional Stainless Steel Insert	6.58	8.00

Item #	Description
682-467	Tissue Characterization Phantom
682-468	Titanium Insert, Optional
682-469	Stainless Steel Insert, Optional

ELECTRON DENSITY PHANTOM

Correlate CT Number and Tissue Electron Density





- **Evaluate CT scan data**
- **Correct for inhomogeneities**
- **Document relationship between CT number and tissue electron density**
- **Simulate indicated tissue within the diagnostic energy range**
- **Quick assessment of distance registration**

B

The Electron Density Phantom is used to account for tissue heterogeneity in radiotherapy treatment planning. The phantom is used with a CT scanner to provide precise correlation between electron density of tissues and their CT number in Houndsfield units (HU).

The Electron Density Phantom consists of two nested disks made from Plastic Water®-LR. They can represent both head and abdomen configurations. Nine different tissue equivalent electron density plugs can be positioned at 17 different locations within the scan field. Included is a water vial plug that can be filled with any fluid. Optional distance marker plugs enable quick assessment of the CT scanner's distance measurement accuracy

Specifications

Overall Dimensions
Electron Density Head Insert: 7" Dia x 1.97" D (180 x 50 mm)
Electron Density Body without Head Insert:
12" W x 10.7" H x 1.97" D (330 x 270 x 50 mm)

Weights
Electron Density Head Insert: approx 2 lb (0.950 kg)
Electron Density Body without Head Insert: approx 4.7 lb (2.1 kg)

Materials: Water and Tissue Equivalent Epoxy Materials

Item #	Description
682-062	Electron Density Phantom

ELCTRON DENSITY PHANTOM ITEM 682-062 INCLUDES

Qty	Description	*Physical Density, (g/cc)	Electron Density x 10^{23} Electrons/cc	RED (Relative to H_2O)
1	Electron Density Head Insert	1.029	3.333	0.998
1	Electron Density Body without Head Insert	1.029	3.333	0.998
2	Lung (Inhale) Equivalent Insert Electron Density Plug	0.20	0.634	0.190
2	Lung (Exhale) Equivalent Insert Electron Density Plug	0.50	1.632	0.489
2	Breast (50% Gland / 50% Adipose) Equivalent Electron Density Plug	0.99	3.261	0.976
2	Solid Trabecular Bone (200 mg/cc HA) Equivalent Electron Density Plug	1.16	3.730	1.117
2	Liver Equivalent Electron Density Plug	1.07	3.516	1.052
2	Muscle Equivalent Electron Density Plug	1.06	3.483	1.43
2	Adipose Equivalent Electron Density Plug	0.96	3.171	0.949
2	Solid Dense Bone (800mg/cc HA) Equivalent Electron Density Plug	1.53	4.862	1.456
1	Solid Dense Bone (1250mg/cc HA) Equivalent Electron Density Plug	1.82	5.663	1.695
1	Water Equivalent Material Surrounding Removable Ø 1" Vial for Real Water Electron Density Plug	1.00	3.340	1.000
1	Set of 2 Feet for 682-062			
1	Soft Carry Case			
1	User Guide			
1	48 Month Warranty			

ELCTRON DENSITY PHANTOM OPTIONAL ACCESSORIES

Item	Description	*Physical Density, (g/cc)	Electron Density x 10^{23} Electrons/cc	RED (Relative to H_2O)
682-207	**800 mg/cc HA in Water Equivalent - Core Insert	1.53	4.862	1.456
682-212	**Titanium Rod Core Insert	4.51	12.475	3.735
682-213	Distance Marker Insert	1.029	3.333	0.998
682-216	Water Equivalent Insert	1.029	3.333	0.998
682-217	**1000 mg/cc HA in Water Equivalent - Core Insert	1.66	5.243	1.570
682-218	**1250 mg/cc HA in Water Equivalent - Core Insert	1.82	5.663	1.695
682-219	*ICRU Cortical Bone Equivalent Core Insert***	1.93	5.956	1.780
682-220	**1500 mg/cc HA in Water Equivalent - Core Insert	1.99	6.134	1.837
682-221	**1750 mg/cc HA in Water Equivalent - Core Insert	2.15	6.600	1.976
682-226	Solid Dense Bone (1000 mg/cc HA) Equivalent Electron Density Plug	1.66	5.243	1.570
682-228	Solid Dense Bone (1500 mg/cc HA) Equivalent Electron Density Plug	1.99	6.134	1.837
682-229	Solid Dense Bone (1750 mg/cc HA) Equivalent Electron Density Plug	2.15	6.600	1.976

* Physical Density - The actual physical density of the insert can vary within ±1% of the manufacturing target density.
Note: CIRS strongly recommends that the user inputs the electron density whenever prompted for material data by the TPS.

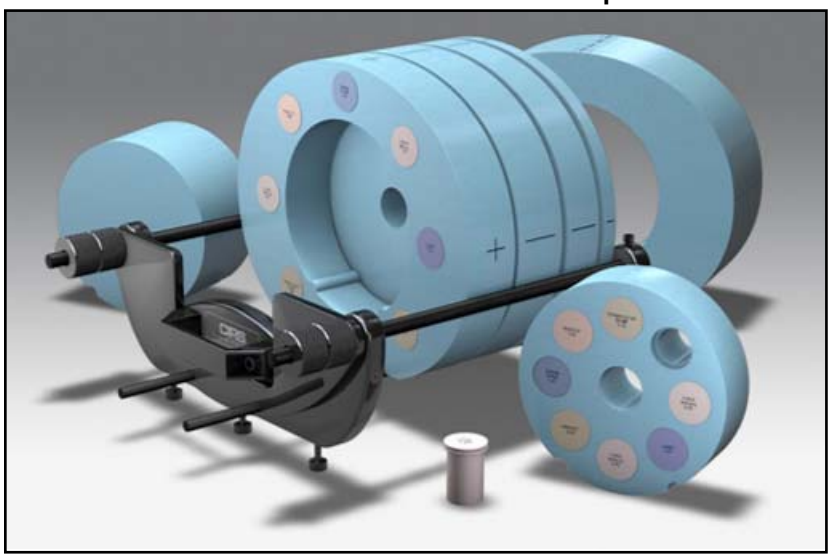
** These inserts have a a standard 30 mm diameter and contain a 10 mm diameter core of the indicated reference surrounded by H_2O-equivalent background. Hydroxyapatite (unit mg/cc) in H2O background Plugs to accommodate chambers, TLD's and film available upon special request. The titanium reference has a unique diameter of 6.35 mm.

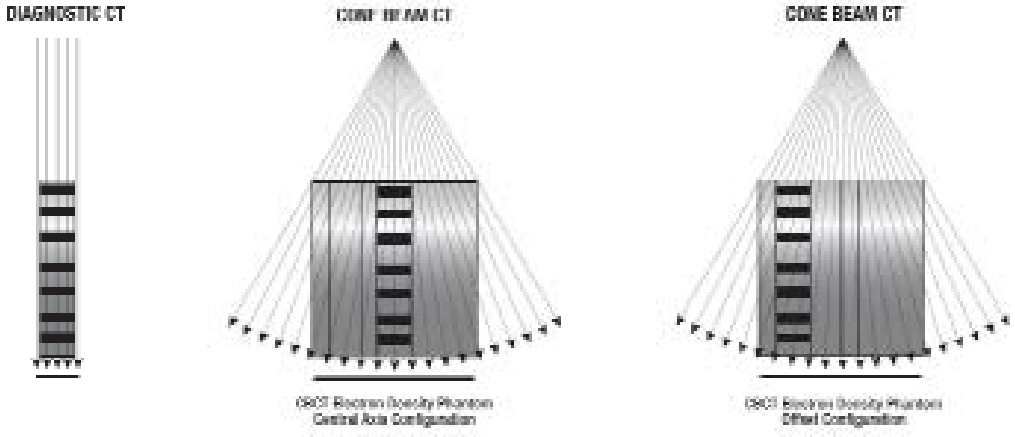
*** CIRS Cortical bone reference is based on ICRU Report No.44, and represents approximately 12.2% H_2O, 24.6% protein, 58% mineral (assumed to be Calcium Hydroxyapatite (HA)), and 5.2% monosaccharides. CIRS further offers a series of mineral density references that mimic various HA concentrations in a pure water-equivalent epoxy background matrix.

† Refer to Appendix A for the CIRS cavity and plug code list of available chamber cavities

CBCT ELCTRON DENSITY PHANTOM

Increase HU Value Confidence for Adaptive RT





A large number of HU readings can be obtained by placing the electron density plugs in different positions both in central axis and offset configurations. Using the equation of curve fitting for collected values, a CBCT to electron density calibration curve can be calculated.

- **Evaluate CT scan data**
- **Correct for inhomogeneities**
- **Document relationship between CT number abd tissue electron density**
- **Simulate indicated tissue within the diagnostic and therapeutic energy range**
- **Quick assessment of distance registration (optional)**

The Cone Beam (CBCT) Electron Density Phantom is an extended version of Item 682-062 Electron Density Phantom and specifically designed for Cone Beam CT Imaging systems. Preliminary data shows that there may be differences between the HU readings for Diagnostic CT and Cone Beam CT. The geometry of the Cone Beam CT requires additional material and suggests that off central axis measurements should be taken.

The phantom was designed in collaboration with Dr. Peter H. Cossmann, PhD to provide a reliable tool for CT number to electron density calibration in volumetric imaging. Reliable CT calibration curves help enable treatment plan adaptation directly from Cone Beam CT data. Additionally, the phantom can accommodate any ion chamber for dose measurements and validation of heterogeneity correction based on the corrected CT calibration curve.

The CBCT Electron Density Phantom's size covers geometries for imagers with dimensions of up to 40 cm x 40 cm. It is made of Plastic Water®-LR and contains the same set of tissue equivalent electron density inserts as the standard Item 682-062. Additional interchangeable slabs allow for repositioning of the electron density section off axis.

Specifications

Overall Dimensions: 13" W x 10.6" H x 9.8" D (33 x 27 x25 cm)
Weight: 40 lb (18 kg)
Materials: Water and Tissue Equivalent Epoxy Resin

CBCT ELECTRON DENSITY PHANTOM ITEM 682-200 INCLUDES

Qty	Description	Physical Density (g/cc)	Electron Density Per cc x 10^{23}	RED (Relative to H_2O)
1	CBCT Electron Density Head Insert	1.029	3.333	0.998
1	CBCT Electron Density Body with Head Insert	1.029	3.333	0.998
2	Lung (Inhale) Equivalent Insert Electron Density Plug	0.20	0.634	0.190
2	Lung (Exhale) Equivalent Insert Electron Density Plug	0.50	1.632	0.489
2	Breast (50% Gland / 50% Adipose) Equivalent Electron Density Plug	0.99	3.261	0.976
2	Solid Trabecular Bone (200 mg/cc HA) Equivalent Electron Density Plug	1.16	3.730	1.117
2	Liver Equivalent Electron Density Plug	1.07	3.516	1.052
2	Muscle Equivalent Electron Density Plug	1.06	3.483	1.043
2	Adipose Equivalent Electron Density Plug	0.96	3.171	0.949
2	Solid Dense Bone (800 mg/cc HA) Equivalent Electron Density Plug	1.53	4.862	1.456
1	Solid Dense Bone (1250 mg/cc HA) Equivalent Electron Density Plug	1.82	5.663	1.695
1	Water Equivalent Material Surrounding Removable, 1" dia Vial for Real Water Electron Density Plug	1.00	3.34	1.00
1	50 mm Thick Bolus Slab	1.029	3.333	0.998
2	100 mm L x 30 mm dia Background Equivalent Plug	1.029	3.333	0.998
1	12.5 mm Thick Bolus Slab	1.029	3.333	0.998
1	37.5 mm Thick Bolus Slab	1.029	3.333	0.998
1	CBCT Image Quality Phantom -Annulus (100 mm Thick)	1.029	3.333	0.998
1	CBCT Image Quality Phantom-Annulus Solid Insert (100 mm Thick)	1.029	3.333	0.998
1	Holder/Support set for 682-200 & Model 062MQA			
1	Soft Carry Case for 682-200			
1	User Guide			
1	48 Month Warranty			

CUSTOMERS ARE ENCOURAGED TO COMPLETE THEIR ORDER WITH THE PURCHASE OF THE INSERT OPTION LISTED BELOW

Item	Description	*Physical Density, (g/cc)	Electron Density x 10^{23} Electrons/cc	RED (Relative to H_2O)
682-214	†Water Equivalent Chamber Rod with Cavity for Ion Chamber	1.029	3.333	0.998

†Refer to Appendix A for the CIRS cavity and plug code list of available chamber cavities.
If the ion chamber cavity is not specified by customer, phantom is supplied with cavity that accommodates a Farmer type ion chamber.

CBCT ELECTRON DENSITY PHANTOM OPTIONAL ACCESSORIES

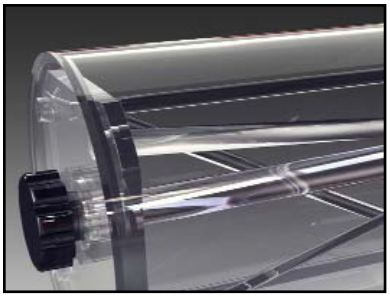
Item	Description	*Physical Density, (g/cc)	Electron Density x 10^{23} Electrons/cc	RED (Relative to H_2O)
682-207	**800 mg/cc HA in Water Equivalent - Core Insert	1.53	4.862	1.456
682-212	**Titanium Rod Core Insert	4.51	12.475	3.735
682-213	Distance Marker Insert	1.029	3.333	0.998
682-216	Water Equivalent Insert	1.029	3.333	0.998
682-217	**1000 mg/cc HA in Water Equivalent - Core Insert	1.66	5.243	1.570
682-218	**1250 mg/cc HA in Water Equivalent - Core Insert	1.82	5.663	1.695
682-219	*ICRU Cortical Bone Equivalent Core Insert***	1.93	5.956	1.780
682-220	**1500 mg/cc HA in Water Equivalent - Core Insert	1.99	6.134	1.837
682-221	**1750 mg/cc HA in Water Equivalent - Core Insert	2.15	6.600	1.976
682-226	Solid Dense Bone (1000 mg/cc HA) Equivalent Electron Density Plug	1.66	5.243	1.570
682-228	Solid Dense Bone (1500 mg/cc HA) Equivalent Electron Density Plug	1.99	6.134	1.837
682-229	Solid Dense Bone (1750 mg/cc HA) Equivalent Electron Density Plug	2.15	6.600	1.976

* These inserts contain a 10 mm diameter core of indicated bone reference surrounded by H2O background.
Hydroxyapatite (unit mg/cc) in H_2O background Plugs to accommodate chambers, TLD's and film available upon special request.
† Refer to separate CIRS cavity and plug code list for available chamber cavities.

Item #	Description
682-200	CBCT Electron Density Phantom

GILLIAN QA PHANTOM

Evaluate Image Distortion and Alignment in SPECT/CT, PET/CT and MRI

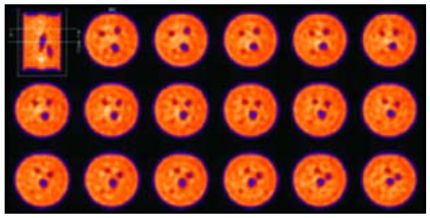


CT Image

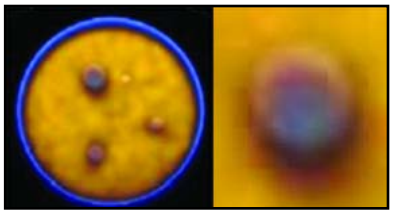
SPECT Image

Combined Image showing verticle misalignment

Combined Image showing more serious alignment problem



Transverse SPECT of Phantom



Misalignment detail

- **Compatible with SPECT/CT, PET/CT and MRI**
- **Check alignment and distortion across the entire imaging field**
- **Easy to fill and drain**
- **Allows for independent assessment of equipment function**
- **Simple geometry allows for quick visual interpretation**

Hybrid scanning systems such as SPECT/CT and PET/CT are increasingly being used to improve tumor identification, treatment delivery and monitor treatment effectiveness. By combining images from two different imaging modalities, hybrid scanning systems take advantage of the strengths of individual imaging modalities while minimizing their respective weaknesses. Proper alignment of the fused images is an ongoing concern.

The Gillian QA Phantom provides a simple and cost effective solution to verify image alignment and distortion. The phantom consists of a water tight acrylic cylinder that can be filled with a variety of fluids. Four non-parallel rods of varying diameter run the entire length of the cylinder. Images produced with the phantom can quickly and clearly show if there is any mismatch in the fused images.

Gillian QA Phantom Includes

(1) Phantom body with rods
(1) Plug
(1) Stand
(1) User Guide
48 Month Warranty

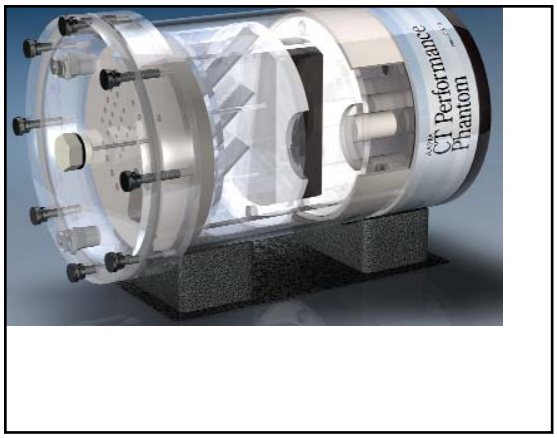
Specifications

Overall Dimensions: 10" x 10.75" x 16" (25.4 x 27.3 x 40.7 cm)
Weight: 14 lb (6.4 kg)
Materials: Acrylic
Rod Diameters: 0.5", 0.75", 0.87" and 1.26" (12.75, 19, 22 and 32 mm)

Item #	Description
682-850	Gillian QA Phantom

AAPM CT PERFORMANCE PHANTOM

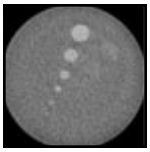
Meets guidelines in AAPM Report #1 "Performance Evaluation and Quality Assurance of CT Scanners"



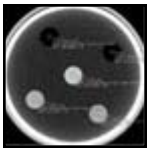
Measurement Capability

- **Noise**
- **Sensitivity / Detectability**
- **Mechanical Alignment**
- **Beam Hardening**
- **Slice Thickness**
- **Size Independence**
- **Radiation Dose**
- **Spatial Uniformity**
- **HU Linearity**
- **Spatial Resolution & line spread function**

Item 682-010 Includes

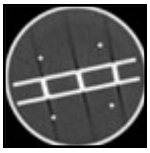


Contrast Test Object
(This option is only available with purchase of the phantom body)
8.5" OD x 2.5" L (21.6 x 6.35 cm) solid acrylic equivalent disk block with 12 fillable cavities 2.25" deep (5.72 cm). Two of each cavity with diameters: 1, 0.75", 0.50", 0.375", 0.25", and 0.125" (2.54, 1.9, 1.27, 0.95, 0.64, 0.32 cm), spaced twice their diameter apart from a center line. Cavities can be easily filled from the ouside with dextrose or sodium chloride solutions of various concentration.

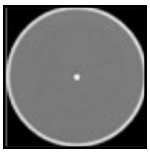


CT Number Linearity Insert
7.5" OD x 2.5" L (19.05 x 6.35 cm) includes 1" diameter (2.54 cm) rods of polyethylene, PMMA (acrylic), polycarbonate, polystyrene, and nylon. Density values (g/cc): polyethylene - 0.95, polystyrene - 1.05, nylon - 1.1, acrylic - 1.19, polycarbonate - 1.20.

Resolution Insert
7.5" OD x 2.5" L (19.05 x 6.35 cm) with acrylic equivalent test object with 8 sets of air thru holes (five holes per set): Diameter of holes is 1.75, 1.5, 1.25, 1.00, 0.75, 0.61, 0.50, and 0.40 mm. Distance between each hole equal to hole diameter. Each row is 5 mm apart. Insert also contains a 0.009" (0.023 cm) stainless steel wire positioned longitudinally for calculation of linespread function.



Slice Thickness Insert
7.5" OD x 3.5" L (19.05 x 8.89 cm) Contains three 0.025 x 1" (0.064 x 2.54 cm) aluminum strips angled at 45°, positioned on center and aligned vertically.



Alignment Pin
0.25" diameter x 3" L (0.64 x 7.62 cm) aluminum pin with threaded attachement to housing cover plate.

Image Unavailable

Bone Ring
7.65" ID x 0.2" wall thickness x 2.8" L (19.43 x 0.5 x 7.1 cm) cortical bone ring. Fits over linearity, resolution and slice thickness insert to harden the beam.

User Guide
48 month warranty

The AAPM CT Performance Phantom offers the user a single test object that measures ten distinct CT performance parameters. The phantom design is based on the guidelines presented in Report #1 of the American Association of Physicists in Medicine Task Force on CT Scanner Phantoms. The goals of report #1 were to "(1) define 'performance' of a CT scanner and (2) describe methods of performance testing through utilization of particular phantoms."

A CT number linearity insert, high contrast resolution insert and slice width insert are housed in an 8.5" diameter (21.6 cm) PMMA water tank with quick disconnect valves for ease of filling and draining between use. Also included is a 0.25" (0.64 cm) bone equivalent ring that can be fit over the inserts to evaluate the effects of beam hardening.

A contrast test object is adhered to the bottom of the tank that includes two rows of cavities from 1 to 0.125" diameter (2.54 to 0.32 cm). The cavities can be filled with various solutions for contrast evaluation. An aluminum alignment insert is incorporated in the lid of the tank and can be interchanged with a polystyrene TLD insert for dose measurements.

A user's manual, holding cradle, filling tubes and other accessories are included. Optional items: Low contrast test object insert external whole-body resolution / noise ring or carrying case.

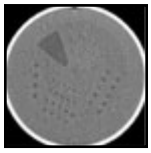
Specifications

Overall Dimensions: 8.5" OD x 15.5" L (21.6 x 39.4 cm)
Empty Weight: 17.25 lb (7.9 kg)
Phantom Housing: PMMA cast 8.5" ID x 12.75" L (21.6 x 32.4 cm) with removable lid

Optional Accessories

Image Unavailable

Item 682-014 TLD Insert
0.5" dia. x 3.5" L (1.3 x 8.9 cm) PMMA rod drilled 3" deep (7.6 cm) to accept TLD's. Can be swapped with Alignment pin in housing cover without removing the cover.



Item 682-012 Low Contrast Insert
8" OD x 1.18" L (20.3 x 3 cm) propietary epoxy with CT density 6-10 HU above water. The test object contains a series of water-filled holes from 2.5 to 7.5 mm in diameter, in 0.5 mm steps. For each target size the center-to-center distance between holes is twice the hole diameter.

Image Unavailable

Item 682-013 Whole Body Resolution and Noise Ring
12" OD x 8.5" ID x 2.5" L (30.5 x 21.6 x 6.4 cm) fits over phantom housing and contains the same test object as the Resolution Insert, at two locations 90° apart.

Item 682-015 Low Contrast Insert- Spherical Targets
8" OD x 1.18" L (20.3 x 3 cm) Plastic Water® equivalent background. The test object contains spheres 5, 10 & 20 CTU above background and 3 reference plugs for each material used as spheres.

Item #	Description
682-010	AAPM CT Performance Phantom
682-014	TLD Insert
682-012	Low Contrast Insert
682-013	Whole Body Resolution & Noise Ring
682-015	Low Contrast Insert - Spherical Targets
682-020	Carrying Case, Foam-Lined

NUALINE LASERS FOR CT AND LINAC ROOMS

710-993

710-994

710-995

710-998

710-997

B

- **Individual laser line has micro Angular and Transverse adjustments.**
- **It is extremely easy for installation and routine calibration. Customers may be able to install the lasers without professional help.**
- **The laser's compact size makes it fit any existing laser systems.**
- **No tools required.**

Item 710-993 GSG1 Green Sagittal Laser
The laser head could pivot in a range of 135° for flexible location (on the ceiling direct above the couch or on a vertical wall).

The laser line has two adjusting knobs. One for tilting laser line and one for moving laser line transversely. The adjustment is tool-less.

Item 710-994 GCR1 Green Crosshair Laser
The laser head could be adjusted over the mounting base for laser center alignment.

Each laser line has two adjusting knobs. One for tilting laser line and one for moving laser line transversely. The adjustment is tool-less.

Item 710-995 SG1 Red Sagittal/Backpointer Laser
The laser head could pivot in a range of 135° for flexible location (on the ceiling direct above the couch or on a vertical wall).

The laser head could be adjusted over the mounting base for laser center alignment.

The laser line has two adjusting knobs. One for tilting laser line and one for moving laser line transversely. The adjustment is tool-less. This feature brings easiness for both installation and routing calibration.

This laser (without a line generator lens) could also be used as a back-pointer.

Item 710-997 CR2 Red Crosshair Laser
Model CR2 is designed for small treatment rooms with diagonal layout. The laser head has a pivoting range of 135°. No additional mounting bracket is needed.

Two internal screws for adjusting cross hair line (as a whole) horizontally and vertically. The line titling is done by rotate the laser head over the mounting base.

Item 710-998 CR3 Red Crosshair Laser
The laser head could be adjusted over the mounting base for laser center alignment.

Each laser line has two adjusting knobs. One for tilting laser line and one for moving laser line transversely.

The adjustment is tool-less. This feature brings easiness for both installation and routing calibration.

Specifications

Electrical power consumption
Red laser: <0.2A / 7VDC.
Green laser: <1A / 3VDC

FDA Compliance
Nualine laser meets FDA requirement of class I medical device. Nualine laser devices are listed with FDA and the company is registered with FDA. A warning label on the device meets FDA code 1040.10.

Item #	710-993	710-994	710-995	710-997	710-998
Model	GSG1	GCR1	SG1	CR2	CR3
Description	Green Sagittal	Green Crosshair	Red Sagittal/Backpointer	Red Crosshair	Red Crosshair
Wave Length	532nm DPSS	532nm DPSS	635nm	635nm	635nm
Line Width	< 1 mm	< 1 mm	< 1 mm	< 1 mm	< 1 mm
Range	4 -15' (1.2 - 4.5 m)	4 -15' (1.2 - 4.5 m)	6 -12' (1.8 - 3.7 m)	6 -12' (1.8 - 3.7 m)	6 -12' (1.8 - 3.7 m)
Focus	Adjustable	Adjustable	Fixed	Fixed	Fixed
Size	3" x 5.9" x 2" (7.6 x 15 x 5 cm)	4" x 5.9" x 1.8" (10.2 x 15 x 4.5 cm)	3.2" x 2.75" x 2.3" (8.1 x 7 x 5.8 cm)	3.5" x 3" x 2.3" (8.9 x 7.6 x 5.8 cm)	4.5" x 4" x 2" (11.4 x 10.2 x 5 cm)
Weight	15 oz (425 gm)	28.3 oz (800 gm)	10.6 oz (300 gm)	12.9 oz (365 gm)	19.5 oz (550 gm)

CENTRALITE® RED DIODE FIXED LASERS

- **Unique three-filter design reduces transient power issues and extends diode life**
- **Precise line quality with width of less than 1mm at isocenter and line depth of field of 1.5m – 4m ensures accurate position reproducibility**
- **Fingertip controls provide independent adjustments for angle of rotation of cross-lines**

Red diode lasers have long been the standard in radiation therapy. Three configurations are offered for the Centralite® Red Diode Lasers. The lasers may also be purchased individually.

Specifications

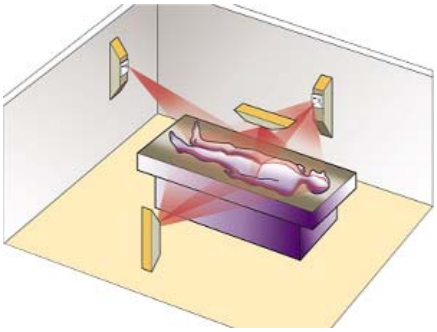
Red Diode Laser
Laser Beam Output: Less than 1 mW per beam (Class II laser)
Line Width: 0.9-1.2 mm at isocenter when mounted 3 m from isocenter.
Fan Beam Angle: Greater than 50 degrees.
Wavelength: 650 nm
Adjustment Sensitivity: Less than 0.1 mm (manual or motor drive).
Drift: No measurable drift
Power: 115/220 Vac 50/60 Hz AC/DC converter.
Dimensions: Mounting plate and case 5.5" W x 3.9" D x 13" H
Certification: Complies with CDRH regulations for Class II lasers.
CE

Low Profile Laser
Mounting Plate: 5.5" W x 7.5" L x 0.2" D
Case: 4.25" W x 5.75" L x 1.85" D

Item	Centralite® Lasers
710-910	Red Diode Cross Laser
710-920	Red Diode Sagittal Laser
710-928	Low Profile Red Diode Cross Laser
710-929	Low Profile Red Diode Sagittal Laser

B

LS-1 LASER SYSTEM

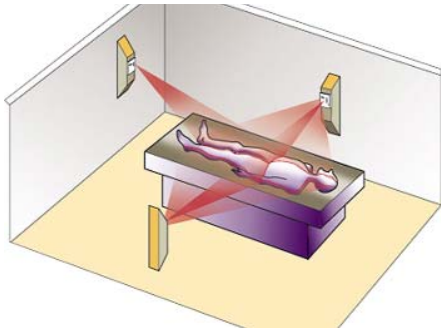


Depending on the configuration of the room, the two lateral and overhead cross lasers may be mounted either vertically or horizontally. The sagittal laser mounts vertically on the back wall, allowing the beam to project downward at a 20° angle.

System Includes
3 Red Diode Cross Lasers
1 Red Diode Sagittal Laser
Mounting Plates and AC/DC Converter

Item	Centralite® Laser Systems
710-941	LS-1 Red Diode

LS-2 LASER SYSTEM

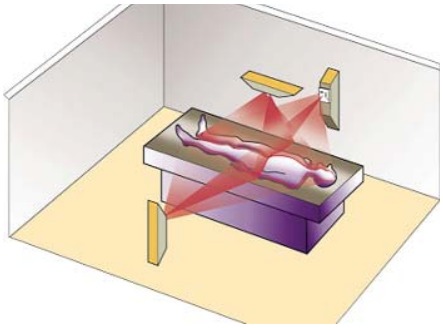


The two lateral cross lasers may be mounted vertically or horizontally. The sagittal laser is mounted vertically on the back wall, allowing the beam to project downward at a 20° angle.

System Includes
2 Red Diode Cross Lasers
1 Red Diode Sagittal Laser
Mounting Plates and AC/DC Converter

Item	Centralite® Laser Systems
710-942	LS-2 Red Diode

LS-3 LASER SYSTEM



In this configuration, two cross lasers may be mounted vertically or horizontally on opposing walls. The third laser is mounted on the ceiling, allowing the two beams to project downward through the isocenter.

System Includes
3 Red Diode Cross Lasers
Mounting Plates and AC/DC Converter

Item	Centralite® Laser Systems
710-943	LS-3 Red Diode

CENTRALITE® GREEN DIODE FIXED LASERS

Green diode lasers deliver the same accuracy as red diode lasers while projecting an image that is easier to see across a wider variety of skin tones. A Green laser also minimizes line diffusion on the skin.

Specifications

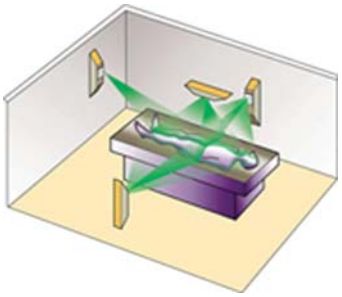
Laser Beam Output: Less than 1 mW (Class II laser)
Line Width: 0.9-1.1 mm at isocenter when mounted 3 m from isocenter
Fan Beam Angle: Greater than 50°
Wavelength: 532 nm
Adjustment Sensitivity: Less than 0.2 mm
Drift: No measurable drift
Power: 115/230 Vac 50/60 Hz AC/ DC converter
Dimensions: Mounting plate and case 5.5" W x 3.9" D x 17.5" (14 x 10 x 44.5 cm)
Certification: Complies with CDRH regulations for Class II lasers

CE

- **Appear brighter to the human eye than red lasers**
- **Minimize line diffusion on skin**
- **Project clearer image across a wider variety of skin tones**
- **Deliver same accuracy as red diode lasers**

Item	Centralite® Lasers
710-930	Green Diode Cross Laser
710-935	Green Diode Sagittal Laser

LS-4 LASER SYSTEM

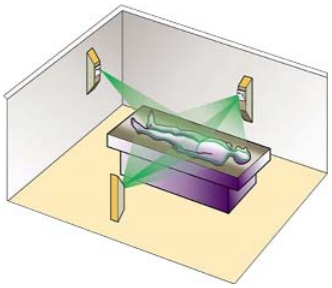


To match the configuration of your room, the overhead and lateral cross lasers may be mounted either vertically or horizontally. The cylindrical lens of the sagittal laser projects the beam at a 20° angle that runs the length of the couch.

System Includes
3 Green Diode Cross Lasers
1 Green Diode Sagittal Laser
Mounting Plates and AC/DC Converter

Item	Centralite® Laser System
710-944	LS-4 Green Diode

LS-5 LASER SYSTEM

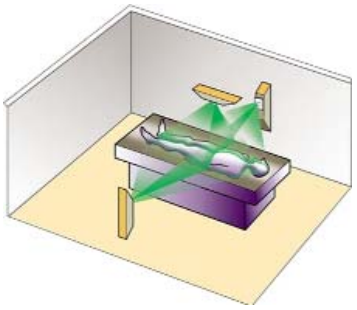


The two lateral cross lasers may be mounted vertically or horizontally. The sagittal laser is mounted vertically on the back wall, allowing the beam to project downward at a 20° angle.

System Includes
2 Green Diode Cross Lasers
1 Green Diode Sagittal Laser
Mounting Plates and AC/DC Converter

Item	Centralite® Laser System
710-945	LS-5 Green Diode

LS-6 LASER SYSTEM



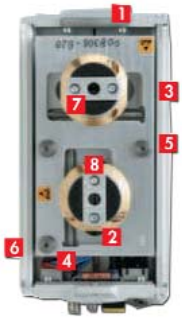
In this configuration, two cross lasers may be mounted vertically or horizontally on opposing walls. The third laser is mounted on the ceiling, allowing the two beams to project downward through the isocenter.

System Includes
3 Green Diode Cross Lasers
Mounting Plates and AC/DC Converter

Item	Centralite® Laser System
710-946	LS-6 Green Diode

LAP LASERS

Laser Systems for Patient Alignment



ASTOR RED
Manual Adjustments
1. Rotates Vertical Line
2. Rotates Horizontal Line
3. Moves Vertical Line Left/Right
4. Moves Horizontal Line Up/Down
5. Tilts Vertical Plane
6. Tilts Horizontal Plane
7. Turns to Focus Vertical Line
8. Turns to Focus Horizontal Line

Integrated Tiltable Bracket

ASTOR GREEN
Manual Adjustments
1. Moves Cross Left/Right
2. Moves Cross Up/Down
3. Rotates Cross
4. Tilts Horizontal Plane
5. Tilts Vertical Plane
6. Turns to Focus Lines
• Cross Angle, Factory Set to 90°

APOLLO RED & GREEN
Remote Controlled Adjustments
• Moves Cross Left/Right
• Moves Cross Up/Down
• Rotates Cross
• Tilts Vertical Plane
• Tilts Horizontal Plane
• Turns to Focus Lines
• Cross Angle, Factory Set to 90°

B

ASTOR Treatment Room Lasers set the standard for accuracy, stability, ease of adjustability and quality.

They are available with red or green laser lines and have the added benefit of an all internal six axis adjustment system that is unparalleled when it comes to precision applications such as stereotactic radio surgery. The ASTOR's dual diode system with special optics delivers extremely long fine lines. The compact housing and angle bracket make it extremely versatile when it comes to mounting the unit in your treatment room environment.

The green Astor lasers have a uniquely engineered thermostatic control system to further prolong the diode life. Special optics such as a prism allow the green laser lines of the ASTOR laser to be extremely long, narrow, bright and of equal line width.

The remote control adjustable APOLLO lasers are the most advanced treatment room laser on the market today.

The all internal adjustment system - standard on all of LAP treatment room lasers - makes them the best available option for precision applications such as stereotactic radio surgery. On the APOLLO laser all six axis internal adjustments are available to you through the single infrared remote control that can be programmed to operate up to six lasers in a room. APOLLO lasers are available in red or green. The green APOLLO lasers have a uniquely engineered thermostatic control system to further prolong the diode life.

Special optics such as a prism allow laser lines of the APOLLO laser to be extremely long, narrow, bright and of equal thickness. The APOLLO's compact housing and angle bracket make it extremely versatile when it comes to mounting the unit in your treatment room environment.

Specifications	ASTOR Red	ASTOR Green	APOLLO Red	APOLLO Green
Line Width Up to 4 m Distance	<1 mm	<1 mm	<1 mm	<1 mm
Line Length at 3 m / 10 ft Distance	5 m / 15 ft	3 m / 10 ft	4 m / 12 ft	3 m / 10 ft
Laser Type	Laser diode	Diode Pumped Solid State	Laser diode	Diode Pumped Solid State
Wavelength	635 nm	532 nm	635 nm	532 nm
Output	<1mW	<1 mW	<1mW	<1 mW
Power Requirements	110/230 V AC/5 V DC	110/230 V AC/5 V DC	110/230 V AC/5 V DC	110/230 V AC/5 V DC
Main Voltage	5 V DC	5 V DC	5 V DC	5 V DC
Power Consumption	1 W	10 W	1 W	10 W
Ambient Temperature	0-40 ° C	15 -30 °C	0-40 ° C	15 -30 °C
Dimensions (H x W x D)	188 x 86 x 93 mm	221 x 110 x 101 mm	221 x 110 x 104 mm	221 x 110 x 104 mm
Weight	1.5 kg / 3.3 lbs	2.4 kg / 5 lbs.	2.3 kg / 5 lbs	2.3 kg / 5 lbs.
Isocenter Adjustment Accuracy	± 0.5 mm	± 0.5 mm	± 0.5 mm	± 0.5 mm

BACKPOINTER

The solid state diode Backpointer laser come in either red or green. The small housing of the red diode Backpointer has been specially designed to replace the fiber optic head of the older generation

Item	LAP Lasers
711-001	ASTOR Red - Crosshair
711-002	ASTOR Red - Line
711-010	ASTOR Green - Crosshair
711-012	ASTOR Green - Line
711-015	APOLLO Red - Crosshair
711-017	APOLLO Red - Line
711-020	APOLLO Green - Crosshair
711-022	APOLLO Green - Line
711-025	Backpointer Laser - Red
711-026	Backpointer Laser - Green

LAP LASER APOLLP BLUE

Advanced Laser System for Patien Alignment

B

APOLLOblue ROOM LASERS – HIGH PRECISION TOOLS FOR PATIENT SETUP AND IMPROVED TREATMENT QUALITY

Precise, accurate and reproducible patient positioning is paramount to the success of radiation therapy treatments. Combined with on board imaging systems the patient positioning lasers provide an interface between the patient and the treatment delivery system. Room lasers are necessary tools for aligning the patient, daily reference isocenter adjustments, and assuring optimized isocenter accuracy for your linear accelerator. The LAP APOLLOblue lasers deliver the highest precision, accuracy and reproducibility: with their long lines and 6 degrees of remote controlled freedom they are ideally suited for today's advanced treatments.

Key points blue vision laser:

- **Clearest lines**
- **Finest lines**
- **Human skin reflects blue light better**

WHY BLUE LASERS?

The human retina contains approximatively 120 millions rods and only 6 millions cone receptors, which, when stimulated by light, send signals to the brain. These signals are subsequently interpreted as vision. Rods and cones are not equally sensitive to visible wavelengths of light. Unlike the cones, rods are more sensitive to blue light and are not sensitive to wavelengths greater than 640 nm, the red fraction of the visible spectrum. If the human eye is exposed to less light than normal, the reception changes from photopic to scotopic sight. This increases the sensitivity of the human eye to blue light by a factor of 10 or more, whereas sensitivity for green increases only by a factor of 2 or less and for red it is reduced to less of even more.

The best working environment for blue lasers is a dimmed room. This is the case in a CT or linac room.

Because of the shorter wavelength, blue laser light penetrates organic materials and skin less than red or green laser light. Scattering and diffuse reflections such as interactions with oxygenated blood are reduced. The longer wavelength of red and green lasers, leads correspondingly, to an increase in the penetration depth.

LINE QUALITY MAKING THE DIFFERENCE

When using a treatment or imaging system the isocenter must be precisely verified. The LAP APOLLOblue positioning lasers project ultra-fine laser lines denoting the isocenter of these systems so that the patient can be quickly and accurately placed on the treatment couch in a reproducible position. LAP APOLLOblue lasers set the highest standard when it comes to line quality, stability, reliability and ease of use.

EASE OF ADJUSTMENT

During the installation of the treatment machine the APOLLOblue lasers are adjusted so that their respective laser lines precisely intersect the isocenter. If over time further adjustments are required to achieve accuracy and performance related to the true isocenter of the treatment machine, the APOLLOblue lasers offer an advanced remote controlled system that provides fast and simple adjustments from a convenient handheld remote control.

Specifications

Line width (up to 4 m distance): < 0.5 mm (FWHM)
Line length (at 3 m distance): 3 m
Laser type: Diode
Wavelength: 450 nm
Output power: < 1 mW
Laser class: 2
Supply voltage: 110/230 VAC, 24 VDC
Power consumption: 1 W
Dimensions (H x W x D): 221 x 110 x 100 mm
Weight: 2.6 kg
Adjustment accuracy at isocenter: ±0.5 mm

CE

Item	Description
711-027	LAP Laser APOLLO - Blue Crosshair
711-028	LAP Laser APOLLO - Blue Line

PROBE DIODE LASERS

711-220

711-222

- **Variable light intensity adjustment**
- **Similar footprint as the HeNe lasers**
- **Compact design**
- **635 nm laser diode**
- **Protective shielding around the laser lamp itself to enhance its life**
- **Line adjustment range of 180°**
- **Economical**
- **Very bright laser and thus easy to see**
- **Simple and easy to mount**
- **Protective shielding for the electronics to help the laser last longer**
- **Variable intensity control permits users to adjust the laser brightness based on room lighting conditions**

The Probe Diode Laser offers an alternative technology to the standard HeNe lasers. The Probe meets all of the specifications of the Exact-Align turret laser. This means that all of the existing features of the turret laser are now available in this more convenient and compact size. It also has the same width base plate as the Exact-Align system so it can be retrofitted to existing turret laser installations with no modifications. This makes conversion from the HeNe systems to the Diode systems cost friendly and easy. Most of the diode products currently available for patient alignment are in the 650 to 670 nm range. The Probe Diode Laser utilizes a 635 nm diode. Because of the optical response of the human eye, the Probe line is perceived as four times as bright as the 670 nm and two times as bright as the 650 nm. The 635 nm yields essentially the same brightness that you can obtain with the helium neon (HeNe) lasers.

Another benefit these lasers offer is a protective shielding for the electronics and especially the diode. This enables the lasers to last longer and perform better than other similar lasers on the market. The Probe also features a variable intensity control that allows you to adjust the laser brightness based on the room lighting conditions. The Probe Diode laser is provided with a 110 VAC to 12 VDC power supply.

Specifications

Laser Beam Output
Power: <0.5 mW (each beam)
Range: Up to 20' (6.0 m)
Line Width: <1.0 mm at 3 m
Line Length: >0.61 m at 3 m
Drift: No measurable drift
WaveLength: 6350 Å (635 nm) visible red
Visibility: Clearly visible in strong ambient light
Intensity: User adjustable to desired levels

Laser Beam Adjustment
Horizontal Range of Vertical Projection: 130" (330.2 cm) at 10' (3.05 m)
Vertical Range of Horizontal Projection: Plus 102 cm/minus 305 cm at 3.05 m
Line angle adjustment range: ±180°
Mounting: Turret adjustable to ±45°

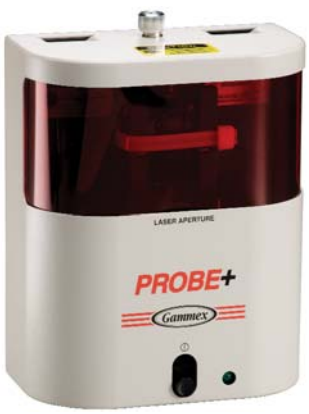
Laser
Size: 6.5" L x 5.4" W x 2.9" D (16.51 x 13.7 x 7.3 cm)
Weight: 4 lb (1.8 kg)
Power Requirements: 12 VDC, 300 mA
Optional Power Supply: 110/220 V (67A400CE)

Certification
Complies with CDRH for Class II lasers and all CE requirements (21 CFR 1040), (IEC 60825-1), (MDD 93/42/EEC)

Item	Probe Diode Lasers
711-220	Red Crosshair
711-222	Red Sagittal

Room packages of 3 or 4 lasers is also available

PROBE+ DIODE LASERS



711-225

711-227

- **160° turret which permits adjustments + 80°**
- **Easily adjustable horizontal and vertical line controls**
- **Similar footprint as the HeNe lasers**
- **Compact design**
- **635 nm laser diode**
- **Protective shielding around the laser lamp itself to enhance its life**
- **Line adjustment range of + 180°**
- **Turret design permits installation of lasers on non-conventional walls for more efficient use of space**
- **Very bright laser and thus easy to see**
- **Simple and easy to mount**
- **Protective shielding for the electronics to help the laser last longer**
- **Variable intensity control permits users to adjust the laser brightness based on room lighting conditions**

The Probe+ Diode Lasers are designed with a 160° turret rotation. Often, existing architectural configurations limit sites from installing traditional lasers, but with the Probe+ difficult room designs are no problem. Our unique and proprietary thermal design of the Probe+ series ensure users of no visible "drift". Vertical and horizontal adjustments allow for angular and planar movement making the Probe+ system easy to install.

The Probe+ Diode Laser alignment systems use a 635 nm wave length laser light and built-in controls to vary the light intensity. Most of the diode products currently available for patient alignment are in the 650 to 670 nm range. Because of the optical response of the human eye, the Probe+ line is perceived as four times as bright as the 670 nm, and two times as bright as the 650 nm. The 635 nm yields essentially the same brightness that you can obtain with our helium neon (HeNe) lasers. The Probe+ also allows a variable intensity control that allows you to adjust the laser brightness based on the room lighting conditions.

Another benefit Probe+ Diode Lasers offer is a protective shielding for the electronics and especially the diode. This enables our lasers to last longer and perform better than other similar lasers on the market. The Probe+ series also have the same width base plate as the Exact-Align system so it can be retrofitted to existing turret laser installations with no modifications. This makes conversion from the HeNe systems to the Diode systems cost friendly and easy.

The Probe+ Diode Laser has a 0.5 mm line at a distance of 2 meters. Complete documentation on laser beam profile is included with each Probe+ diode alignment system.

The standard Probe+ Diode Laser utilizes an external power supply adaptable for international use. The Probe+ Diode Laser system is easy to repair and maintain.

Specifications

Laser Beam output
Power: 0.5 mw (each beam)
Range: Up to 6.0 m
Line width: <0.5 mm at 2 m
Line Divergence (Length): 15-17°
Drift: No measurable drift
WaveLength: 6350 Å (635 nm) visible red
Visibility: clearly visible in strong ambient light

Laser Beam adjustment
Horizontal range of Vertical Projection: 330.2 cm at 3.05 m
Vertical range of Horizontal Projection: Plus 100 cm /minus 300 cm at 3 m
Line angle adjustment range: ±180°
Mounting: Turret adjustable to ±80°

Laser
Size: 6.75" L x 5.5" W x 3" D (17.3 x 14 x 8 cm)
Weight: 4 lb (1.8 kg)
Power requirements: 12 VDc, 300 mA

Universal Power Supply
Power requirements: 110 VAc - 220 VAc, 50 - 60 Hz, 0.4 A
Laser unit includes various adapters for U.S. and international use.

Certification and Compliance
Complies with CDRH for Class II lasers and all CE requirements (21 CFR 1040), (IEC 60825-1), (IEC 61140:2001)
CE marked
Power supply UL, cUL, GS and CE marked

Item	Probe+ Diode Lasers
711-225	Red Crosshair
711-227	Red Sagittal

Room packages of 3 or 4 lasers is also available

PROBEG DIODE LASERS

711-230

711-232

- **160° turret which permits adjustments + 80°**
- **Similar footprint as the HeNe lasers**
- **Compact design**
- **635 nm laser diode**
- **Protective shielding around the laser lamp itself to enhance its life**
- **Line adjustment range of + 180°**
- **Turret design permits installation of lasers on non-conventional walls for more efficient use of space**
- **Very bright laser and thus easy to see**
- **Simple and easy to mount**
- **Protective shielding for the electronics to help the laser last longer**
- **Variable intensity control permits users to adjust the laser brightness based on room lighting conditions**

The ProbeG Green Diode Laser is designed to ensure precise patient positioning during CT simulation and radiation therapy. The ProbeG provides enhanced contrast on various skin tones. Projected green light is "absorbed" thereby minimizing line diffusion which, in turn, creates crisper lines. ProbeG lasers have less than 0.8 mm line width projected at a distance of three meters. This high quality fine line allows precision positioning in all situations. The ProbeG laser's unique mechanical design makes it easy to use and maintain. Most fine laser controls are performed by simply raising the hinged cover and making the desired adjustment. No laser line drift is visible after initial adjustment. The laser is shielded to reduce radiation exposure to the diode and incorporates novel power stabilizing circuitry to extend diode life. ProbeG optics and mounting holes match Probe, Probe+ and HeNe lasers to allow easy retrofit mounting.

Specifications

Laser Beam Output
Power: <1.0 mW (each beam)
Range: Up to 6.0 m
Line Width: <0.8 mm at 3 m
Line Divergence (Length): 15-17°
Drift: No measurable drift
WaveLength: 5320 Å (532 nm) visible green
Visibility: Clearly visible in strong ambient light

Laser Beam Adjustment
Horizontal Range of Vertical Projection: 330 cm at 3 m
Vertical Range of Horizontal Projection: +100 cm / -300 cm at 3 m
Line angle adjustment range: ±180°
Mounting: Turret adjustable to ±45°

Laser
Size: 10.6" L x 5.5" W x 3.1" D (27 x 14 x 8 cm)
Weight: 7 lb (3.2 kg)

Universal Power Supply
Power Requirements: 110 VAC - 220 VAC, 50 - 60 Hz, 0.4 A
Laser unit includes various adapters for U.S. and international use.

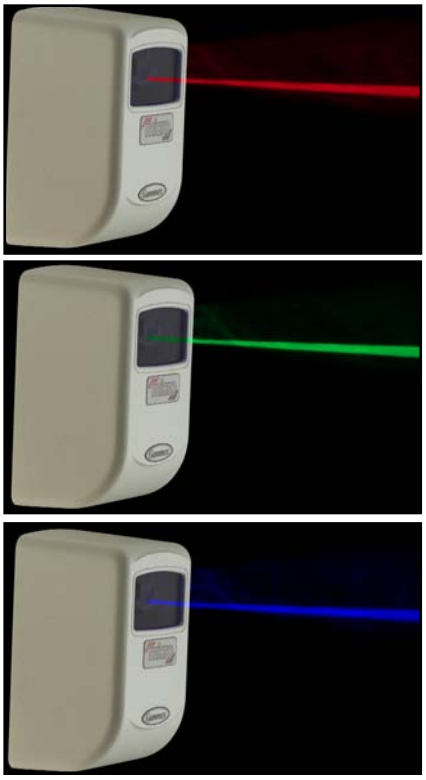
Certification
Complies with CDRH for Class II lasers and all CE requirements (21 CFR 1040), (IEC 60825-1), (MDD 93/42/EEC)

Item	ProbeG Diode Lasers
711-230	Green Crosshair
711-232	Green Sagittal

Room packages of 3 or 4 lasers is also available

MICRO™ DIODE LASER

Ultra Compact Diode Laser



- **Compact size**
- **Superior line width and range**
- **Available in Crosshair and Sagittal**
- **Red, Green or Blue diode colors**
- **Economical**

Small in size but not in capabilities. The new "micro" diode laser family offers an economical alternative to conventional laser systems used for alignment purposes. The "micro" has dimensions that are considerably smaller than other fixed lasers. This makes it easy to fit into tight locations and reduces the chance of hitting the laser and knocking it out of alignment. The new design also makes it simple and easy to mount and focus or align.

Preference for laser diode colors is important based on patient demographics and what colors are best viewed by your personnel. The "micro" comes with a choice of either Red, Green or Blue colors to allow you the maximum site flexibility. These lasers can alos be easily changed to one of the other colors by buying the other color diode and simply changing the diode and recalibrating. This allows for a color change at minimal cost without having to purchase all new lasers.

Its composite housing and esthetically pleasing design fit right in with your treatment room's comforting appearance. The non-metallic housing cover keeps the weight of the entire unit below 800 grams.

The many features of the "micro" laser provide a wide range of benefits including:

- Compact design permitting the laser to blend in well with the room and to remain out of the way
- Utilize different diode colors to simplify marking recognition
- Less complicated and faster installations
- Simple design makes alignment and focus adjustments quick and easy if they need to be performed
- Composite, non-metallic housing cover reduces the laser's weight
- The economical feature of the "micro" laser makes outfitting a room with new lasers easier on your budget.

Specifications

Laser Beam Output
Laser Output: <1.0 mW (each beam)
Range minimum: Up to 6.0 m (20 ft)
Line Width: ≤ 0.5 mm @ 3 m
Line Length: ≥1.0 m @ 3 m
Drift: Not measurable
WaveLength: Red: 635 nm
Green: 515 nm
Blue: 450 nm
Visibility: Clearly visible in strong ambient ligh

Laser Beam Adjustment
Coarse Planar: ±7.6 mm (0.3") horizontal and vertical
Coarse Angular: ±25° horizontal
Fine Angular: ±3.5° horizontal and vertical
Line Rotation: ±180°

Laser Dimensions
Overall Size: 3.63" W x 5.75" L x 3.0" D (9.2 x 14.6 x 7.6 cm)
Weight: 1.6 lb (725 gm)
Power Supply: 110/240 VAC, 50-60 Hz, 0.3 A (Laser unit includes various adapters for US and international use

Item	Micro Diode Lasers
711-300	Crosshair Red
711-303	Crosshair Green
711-306	Crosshair Blue
711-310	Sagittal Red
711-313	Sagittal Green
711-316	Sagittal Blue

Room packages of 3 or 4 lasers is also available